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Assessment of Psychological Factors in Aviators

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Introduction:

Improving our understanding of the psychological make-up of male and female pilots is the objective of "Assessment of Psychological Factors in Aviators" (APFA). Of particular interest are the stressors of mixed-gender aircrew squadrons and the psychological concerns related to combat and deployment. An improved understanding of these two issues will improve safety and increase mission readiness. Little is known about the psychological characteristics of female pilots and pilots who fly crewed aircraft (2). Fighter, test, and light attack pilots, along with astronauts are most frequently studied at the expense of tanker/transport pilots, navigators, weapon systems operators, and flight surgeons (1). Due to the former combat exclusion rule, the majority of female pilots have been assigned to tankers and transports.

Very few studies describe the female aviator's psychological attributes. Novello and Youssel (4) studied 87 general aviation female pilots and found female pilots to be more similar to male pilots than to females in the general population. There is a paucity of data on women in all professions; often data from males is extrapolated to women. Perhaps such extrapolation is scientifically justified; only empirical study will determine if separate norms are required for female professionals.

Judgment, cognitive abilities, personality traits, and crew resource management skills are gauged with the APFA psychological testing battery. Computer administration allows confidentiality and anonymity, as well as standardization (3). The APFA testing battery consists of four well-accepted psychological tests and requires two hours to complete. Supervised by a licensed psychologist, the battery includes: the Multidimensional Aptitude Battery (MAB), a cognitive test; the NEO Five Factor Inventory (NEO-FFI), a personality test; the Personal Characteristics Inventory (PCI), a test of judgment; and the Cockpit Management Attitude Questionnaire (CMAQ), a crew coordination measure.

The semi-structured clinical interview provides information about personal and family health, and career/deployment stressors. The interview covers the impact of grounding greater than 30 days, health decrements due to aircraft design, teamwork difficulties, career goals, roadblocks to success, career demands, combat and POW concerns, stress coping styles, motivation to fly and flying goals. The interview is based on an aircrew survey developed by Voge that had a return rate of over 50% (Personal Communication, V. Voge, July 17, 1994). The interview requires approximately 30-45 minutes and is accomplished by a board-eligible, licensed psychiatrist.

Volunteers are male and female pilots from Air Mobility Command (AMC) and Air Education and Training Command (AETC). To date, volunteers from Travis AFB, California; Charleston AFB, South Carolina; McConnell AFB, Kansas; Randolph AFB, Texas; McChord AFB, Washington; and Dover AFB, Delaware have participated. Thus far, 37 male pilots and 35 female pilots volunteered at these bases. We anticipate participation from pilots at McGuire AFB, New Jersey, Fairchild AFB, Washington, and the United States Air Force Academy in Colorado before the 30 September deadline. The

participation of these remaining bases should provide at least eighty to one hundred volunteers.

Bases:	Women	Men
Travis AFB, CA	10	5
Charleston AFB, CA	6	5
McConnell AFB, KS	9	7
McChord AFB, WA	3	11
Dover AFB, DE	5	9
Randolph AFB, TX	2	

Remaining Bases:	Dates to be visited:
McGuire AFB, NJ	7-11 Aug 95
Fairchild AFB, WA	21-25 Aug 95
United States Air Force Academy, CO	18-22 Sep 95

Text:

Maj. Suzanne E. McGlohn, a board-eligible psychiatrist, and Maj. Raymond E. King, a licensed psychologist, traveled (or will travel) from the Armstrong Laboratory at Brooks AFB, Texas to each base noted above for a week-long stay. An enlisted member usually travels along to provide technical and logistical support. Equipment includes six IBM ThinkPad color notebook computers (486DX with 8 Meg RAM), 20 3.5" DSHD discs, consent forms, volunteer registry data forms, sign-up sheets, surge protectors, interviews, labels, and briefing slides. Prior to their departure, they coordinate their visit with a point of contact (POC) at each base. The POC is responsible for soliciting potential male and female pilot volunteers, arranging a place for a briefing on Monday morning for as many potential volunteers as possible, arranging two rooms to conduct the testing and interviewing, and arranging a place, to which the commander does not have ready access, for the sign-up sheets. The researchers continue to receive maximum assistance with the project from each base, due to the endorsement by AFCC, AFSG, and each MAJCOMs' CC.

Dr. McGohn provides a briefing on Monday morning for as many potential volunteers as possible explaining the nature of the project, how much time will be required, and what is contained in the consent form. Those who remain interested in participating are asked to carefully and critically read and sign a consent form. This form explains the content and purpose of the study and explains the procedures. The study is completely voluntary and anonymous; consent may be withdrawn by a participant at any time without consequence. All information provided on the consent form is protected by the Privacy Act of 1974, as directed by AFR 169-6. The data on the consent form cannot be linked to testing or interview data, further preserving anonymity. Participants are also

asked to fill out a Volunteer Registry Data Sheet. Its purpose is to track participants in the unlikely event of any untoward effects. Again, this information cannot be linked to the data and thus anonymity is preserved. To maintain this strict anonymity we are unable to provide any individual's or unit's test results. All data generated will be reported as group data. After the briefing is given and consent forms are signed and witnessed, participants choose a random number. Sets of random numbers are used to link the testing data to the interview data. Random numbers are not placed on the consent form or data registry sheet, thus preserving anonymity. Pilots may choose not to wear their nametags during the study. When participants have a number, they sign up for testing and the interview at a convenient time during the week.

Dr. King and the technician test from one to six participants on the notebook computers at a time. General demographic information (number of military flying hours, commissioning source, etc.) is collected first, followed by the MAB, then the NEO-FFI, CMAQ, and finally the PCI. Volunteers may take breaks during the testing or even spread completion of the testing battery throughout the week. Dr. McGlohn conducts the semi-structured interviews individually, using a checklist and a tape recorder. Each volunteer is asked whether she or he verbally consents to recording; their response is documented on the interview sheet. Each volunteer is told the recording will be used to create a transcript of the interview, identified by number only, after which the cassette tape will be reused or destroyed. Identifying demographic information is not solicited during the interview.

Upon return to Brooks AFB after each data collection trip, testing and interview data is added to a secured database. The timeline for the remainder of the project is as follows:

1) Oct 95-Finish data collection.
2) Nov 95-Statistically analyze data.
3) Dec 95-Write technical report.
4) Spring 96 - Submit findings and conclusions to peer-reviewed scientific meetings and journals.

Conclusion:

The collection of data is proceeding as planned and adequate numbers of pilots are volunteering at each base to ensure statistical significance at the end of the study period. We anticipate this study will help define unique needs of male and female aviators, help us understand effective communication and performance within mixed-gender squadrons, and provide new information on occupational norms in non-referred pilots. Collecting occupational norms will help define the personality and strengths of the successful pilot, and allow a better understanding than is possible when relying on information collected from individuals psychiatrically referred to the Aeromedical Consultation Service at Brooks. This study will assist the Armed Forces in understanding and coping with the psychological stress associated with combat, deployment, and mixed-gender squadrons. It will also add significantly to much-need research efforts into gender issues.

1.) Fine PM, Hartman BO. Psychiatric strengths and weaknesses of the typical Air Force pilots. School of Aerospace Medicine Technical Report 1968: 121.

2.) Liang S. Male-female differences in variables affecting performance: Aeromedical implications. Unpublished manuscript, June 1982.

3) Moreland KL. Computerized Psychological Assessment: What's Available. In: Butcher JN, ed. Computerized Psychological Assessment. New York: Basic Books, 1987: 34.

4) Novello JR, Youssel ZI. Psycho-social studies in general aviation: II. Personality profile of female pilots. Aerospace Med. 1974: 45 (6).